

Offshore Systems Ltd, N. Vancouver, British Columbia, Canada

By Gwil Roberts

Good afternoon everyone. When I found out I was going to be a speaker today, and that I only had about ten minutes to talk about our company and our product, I decided to limit myself to a subject that would be very focused that will hopefully be relevant to the users and related to the working effort that the Army Corps has been doing on electronic charting in the last several months. So, I'll be talking about S-57 display updating with ECPINS.

First of all, for those of you who are not familiar with Offshore Systems, the company was established in 1977 to do some survey-type work, and that quickly doubled up into electronic chart system technology and led to the production of spectra charts as far back as in 1979.

Today the company is well known for its ECPINS product line, and I'll talk about that a little bit later. And we pride ourselves in being ECDIS, providing precision navigation solutions that meet customer requirements.

What is ECPINS? Well, first of all, ECPINS stands for Electronic Chart Precise and Integrated Navigation System. And it is basically a multi-fuel electronic chart system. And by multi-fuel, we mean that it supports numerous chart formats in a seamless fashion. Of those chart formats are HMBNB, two raster-type formats, and three vector formats being DNC, NTN, NTX and, of course, S-57.

ECPINS can integrate a wide range of centers from your GPS, your gyrocompass to anemometers and so on. And, of course, has a full suite of navigational features for route planning and monitoring.

Well, back to our subject of S-57 display. What can we say about S-57? Well, as we saw a little earlier, it's a very information rich format. And being in vector format means that the system knows every object that composes the chart whether it's a point object like a buoy, a tower, or a line object like underwater cable or control line, and areas such as land or depth areas or anchorage areas.

The level of information that's displayed can be adjusted by the user. What I'm going to do is switch to our application here and show a chart. Actually this is a chart of the Atchafalaya River, and we see some of the objects here.

And what I'll do is vary the level of information that's being displayed. So, I can pop this window here and go through different viewing groups and select the type of object I want to display. I can select soundings, for example, and I'll have soundings being displayed. This one is the chart zooming in. We now see the soundings being displayed.

The same thing I can do with textural information here to add object name. I can add, or it can go to line description. So now we have, for example, the type description and object name for certain buoys.

The other thing is, you probably saw as I was zooming in and out, the information appeared or was removed from the display. And that's again a function of vector chart that you can filter out information as required based on the viewing scale. And, of course, the idea is to reduce the clutter that is displayed.

The other thing, too, is that every object can be inter-updated. So I can go back to my chart and find information about any object. I can go to my navigation tool, and for a chart feature click on an object and have information about it, and then go now and just click on that buoy. So the system will tell me everything that's there, including the buoy. And I have the attributes that were recorded in the chart for that buoy.

I can go, for example, here and find out it's a dredged area with a dredge value of 20 feet. And the nice thing about this one is that the system will highlight in red the area or the object that's been inter-updated. And the other thing, too, is that with S-57 textural or graphical information can also be displayed.

And as it was mentioned before that's all nice, but the navigational environment is dynamic. It changes all the time. The river changes all the time. New dredging can be done. The water level can change and floating aids can be moved or removed, whatever. So, how can S-57 be of benefit in this changing environment? Well, I've identified two ways. The first one is that the depth area can be recovered based on vessel draft and underclear clearance because a vessel draft can also change, and that may change your navigational picture. What you're seeing is chart updating, which was mentioned a little bit earlier as well.

So let's talk about the first one, the safe and unsafe water definition. That is basically outlined first of all from the depth contours that are available in the chart. And the vessel draft in underclear clearance as entered by the mariner. And again I'm going to show an example here.

So, we saw that the dredge channel here was at 20 feet. If I look at what my safety depth here is, I've got 15 feet for a draft and three feet for underclear clearance. If I were to change that let's say to 19 feet, now with my underclear clearance and my draft, I'm exceeding the depth available in that dredge channel. And you see that the coloring has changed. That's because the white indicated that it was safe to navigate there. And the blue color indicated that it's unsafe.

So, as the loading of the vessel varies from voyage to voyage, the navigational picture can be adjusted accordingly. The good aspect is that all of this is done within the information contained in the ENC data set, but the limit is that the depth contours encoded in the ENC can be limited.

If we have depth contours every three feet, changing your vessel draft by a foot or two or three probably won't change the navigational picture. But if we have depth contours encoded at smaller intervals, then that becomes interesting.

The other aspect that I mentioned before was chart updating. S-57 is a nice format to support chart updating. Updates can be transmitted by Internet, floppy, or CD. Normally they're contained within reasonably sized electronic files. And those updates are easily applied by the user through normally a single click, single operator action.

And what I like about this that the chart is displayed in its updated version. I mention that because in the past we've been working with different chart formats where the updates were cumulative. So, if a buoy had been moved three or four times, well the same buoy would appear on the chart three or four times. It's not the case with S-57. Only the last modification that has been applied will be shown on the chart.

So, I unfortunately don't have an example of a chart update on the Atchafalaya River, but I do have some from another chart. So, what I'll do is show a little bit how it can be displayed on the electronic chart system. In this case, it found five updates had been applied to that one particular chart. And it gives me the issue date for each update, and the date and time at which they were applied.

Now, what I can do is go beyond that and find out for each update the changes that were incorporated. An example if I pick update number 4, it found four modifications that were done. And I can even go farther than that and say okay, I want to have information where a plotter was inserted, so I can click on it. I have all the attributes that apply to that, that plotter was inserted. Plus, the system brings me to that particular object on the chart.

And I can do that for just any update that was applied and any object that was in those updates. For example, I know that update number 2 contains a lot of changes. I think 169 of them, but I have information on all of these changes.

So as I said, each modification in each update can be reviewed by the user. So you receive an update, you don't know exactly what's changed. Because as you apply the update, the chart is automatically updated. You can go back to the history and verify each update, each modification, and those updates are sequential. The system will not let you, for example, apply update number 5 unless number 4, 3, 2, and 1 had been applied before. So, it's kind of a situation where you cannot miss an update. The system will warn you.

So in summary, we saw that S-57 is a very information rich vector format. It has lots of display flexibility, and it's very easy to update. And the only thing is it's really limited by the information encoded by the producing agency.

